ETG3500 - ETG2000

3500 - 2000W ICEFET SOLID STATE FM TRANSMITTERS

ELENOS®

broadcast experience

DATA SHEET

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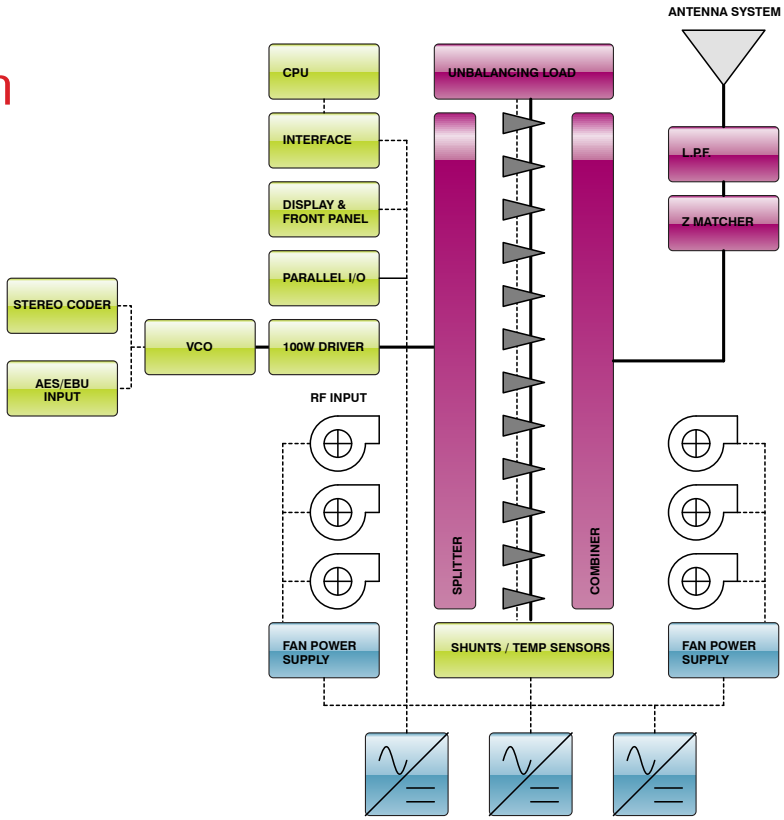
Highlights

- ICEFET®: This technology reduces Mosfet and heat-sink temperatures, improves efficiency and grants higher MTBF. The result is unmatched size, consumption and reliability.
- ALWAYS ON AIR (Fully redundant): The redundancy of this transmitter prevents "SINGLE-POINT-FAILURES" thanks to a "SOFT FAILURE DESIGN", and a protection system which keeps it "ON AIR" even in the most extreme working conditions.
- IPC (Intelligent Power Control): Another exclusive Elenos application. IPC maintains constant the output power within 2% of the setting value, regardless of fluctuations in incoming AC line voltage, RF drive or load conditions.
- IPF (Intelligent Proportional Fold back): IPF is an intelligent system that allows the transmitter to stay "ON AIR" into mismatched loads.
- BROAD BAND: The transmitter keeps optimum performances of power and efficiency over the all broadband operation without needing of tuning. Useful as main transmitter or as reserve in "N+1" applications.
- CONSTANT EFFICIENCY: The Voltage Power Amplifier and the Bias voltage are both controlled to obtain maximum efficiency at any frequency and at any output rated power.
- NO IPA: In Elenos transmitters, the IPA (Intermediate Power Amplifier) is avoided. This choice eliminates one of the bottlenecks in redundancy frequently present on transmitters of this category.
- EASY MAINTENANCE: All parts, RF modules, electronic control boards, blowers, power supplies etc. are easy to replace.
- SMS ALARMS/REMOTE DEEP DIAGNOSTIC CAPABILITY: All alarms and events can be sent by SMS through a GSM modem. The industrial standard Hostlink protocol allows to safety handle huge quantity of information to perform remote deep diagnosis.
- WORLD-WIDE SALES & SERVICE SUPPORT: ELENOS is the FM manufacturer with one of the biggest distribution network of the world. Each distributor is chosen mainly by the technical support capability.

ETG3500
Block diagram



icefet® technology

elenosecosaving®

ETG3500 - ETG2000

GENERAL DATA	
Output Nominal Power	2000W adjustable(ETG2000) 3500W adjustable(ETG3500)
Maximum peak power	2350W (ETG2000) 3550W (ETG3500)
Operating band	87.5 - 108 MHz
Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample-MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel trough OLED /from PC
Microprocessor controlled	Yes
Power supply redundancy	Yes
Number of MOSFETs	8 (ETG2000) 12 (ETG3500)
RF power stage technology	ICEFET & ECOSAVING
MOSFET type	BLF278 Philips
Number of power supplies	2 (ETG2000) 3 (ETG3500)
Dimensions: Rack units	4U
Dimensions: W - H - D	48,5 - 17,6 - 70 cm
Weight	40kg (ETG2000) 43kg (ETG3500)
Number of cooling fans in the amplifiers	5 (ETG2000) 6 (ETG3500)
CONNECTORS	
RF Output connector	7/8
RF Input connector (in power amplifier mode)	BNC
Input connectors LEFT & RIGHT	XLR female
Input connectors AES/EBU	XLR female
MPX Input connector	BNC female
SCA Connector	BNC female
Remote control connector	DB25 female
RS485/232 Connector	DB9 female
RF	
Automatic gain control	Stabilizes the output power value on the set value
Overall output power stability	+/-0,1 dB
Output impedance	50Ω
Harmonic suppression	> 70 dB
Spurious signal suppression	> 80 dB
Driving power amplifier stage	65W (ETG2000) 85W (ETG3500)
Input impedance power amplifier stage	50Ω
Gain power amplifier stage	16dB
V.S.W.R. protection	10% of forward power
Asynchronous residual AM (typical values)	60dB
Synchronous residual AM (typical values)	50dB
RF Efficiency	78%Typ
AUDIO	
AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32,44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+12/-12 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0,1dBm steps from front panel
L/R Input Impedance	Selectable 10K- 600Ω
MPX audio input level	+12/-12 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0,1 dBm steps from front panel
MPX Input impedance	5KΩ selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation
SCA/RDS level adjustment	Soft adjust 0,1 dBm steps from front panel
SCA/RDS Input Impedance	10KΩ
PILOT level adjustment	Soft adjust 0,1 dBm steps from front panel
PILOT Phase adjustment	Soft adjust 0,1 dBm steps from front panel
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	Yes
PERFORMANCE EXCITER	
PLL lock time	<20sec
Time for starting up	30 sec. from OFF/ON
Time for starting up	1 sec. From interlock closure
Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1dB steps adjustable
Frequency steps	10 KHz
Frequency stability	1 ppm from 0 to +40°C
THD+N	<0.03% @ 1KHz
Pre-emphasis	50/75 microseconds +/-0,1dB
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR Weighted	72 dB Weight-ref@53KHz-Qpk
FM S/N STEREO CCIR Unweighted	72 dB Unweight-ref@53KHz-QPk
Mono frequency response	+/-0.15 dB 30Hz - 15KHz
MPX frequency response	+/-0.1 dB 30Hz - 100KHz
Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
SCA frequency response	+/-1 dB 20KHz - 100KHz
Type of modulation	F3 direct modulation FM on RF oscillator
Stereo Crosstalk	-72 dB @ 1KHz
Pilot tone frequency	19 KHz
Pilot tone deviation	7,5 KHz Adjustable
Pilot tone frequency stability	+/-1 Hz
Attenuation at 19KHz	> 45 dB

PERFORMANCE EXCITER	
Phase Response	0.1 degree from linear phase; 53kHz to 100kHz
Modulation Capability	+/-250 KHz
INSTALLATION REQUIREMENTS	
Power supply	220 Singlephase Version, 220/380 Threephase Version 50-60Hz VAC (ETG2000) 110, 220, 380 Threephase-Singlephase 50-60Hz VAC (ETG3500)
Power consumption	3KW (ETG2000) 5.2KW (ETG3500)
Overall Efficiency	67%Typ
Magneto-thermic curve	D
Current Consumption @220VAC/single phase	15 Amp (ETG2000) 23 Amp (ETG3500)
Magneto-thermic capacity @220VAC/single phase	25 Amp (ETG2000) 32 Amp (ETG3500)
Conductor size @220VAC/single phase	6 sqrt.mm (ETG2000) 10 sqrt.mm (ETG3500)
Conductor size @220VAC/single phase	9 AWG (ETG2000) 7 AWG (ETG3500)
Current Consumption @220VAC/three phase	9 Amp (ETG2000) 13 Amp (ETG3500)
Magneto-thermic capacity @220VAC/three phase	16 Amp (ETG2000) 20 Amp (ETG3500)
Conductor size @220VAC/three phase	4 sqrt.mm (ETG2000) 6 sqrt.mm (ETG3500)
Conductor size @220VAC/three phase	11 AWG (ETG2000) 9 AWG (ETG3500)
Current Consumption @380VAC/three phase	5 Amp (ETG2000) 8 Amp (ETG3500)
Magneto-thermic capacity @380VAC/three phase	10 Amp (ETG2000) 16 Amp (ETG3500)
Conductor size @380VAC/three phase	2.5 sqrt.mm (ETG2000) 4 sqrt.mm (ETG3500)
Conductor size @380VAC/three phase	13 AWG (ETG2000) 11 AWG (ETG3500)
COOLING SYSTEM	
Cooling flow (m^3/h)	From 200 to 600 m^3/h (ETG2000) From 300 to 800 m^3/h (ETG3500)
Air temperature increase between output/input	17°C
Cooling system	Foced air-cooling
ENVIRONMENT	
Temperature range (operating)	0 - +45 °C
Temperature range (non operating)	-20 - +70 °C
Humidity range (operating)	95% a 40 °C
Humidity range (non operating)	90% a 65 °C
Altitude range (operating)	<4600 meters
Altitude range (non operating)	<15000 meters
TELECONTROL & TELEMETRY	
Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)
REGULATIONS CONFORMITY	
High frequency radiations from the enclosure	Below limit imposed by technical regulations.
Functionning type	h24 uninterrupted
Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA	
Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE	
MTBF	10 Years
Programmed Maintenance	4 Years
Blower Replacement recurrence	4 - 6 Years (function of temperature)
Electrolitics Replacement Recurrence	8 Years
Lithium batteris replacement recurrence	10 Years
Batteries	Yes, only for alarm list storage
Time to realize the preventive maintenance every 4 years	1 Hour
Time to realize the preventive maintenance every 8 years	2 Hours
Level and number of technician for maintenance	1 technician
Electrical safety	EN60215
Average repair time (change of an RF module or power supply)	1 Hour
SET	
Installation manual Quick Start	Yes
User manual	Yes (On electronic format)
Maintenance manual	Yes (On electronic format)
Tests report	Yes
Troubleshooting manual	Yes (On electronic format)

Elenos Broadcast Experience
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